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Climate, the Earth, and God – Entangled narratives of cultural and climatic change in the Peruvian Andes

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ABSTRACT

How different groups perceive climate-related problems and changes is of growing interest in research and practice, especially in relation to the adaptation of vulnerable communities to climate change. However, research on local climate perceptions to date has tended to focus on *what* changes are perceived, not on *how* those changes are interpreted in particular socio-cultural contexts and given meaning within local worldviews and systems of values and beliefs. Based on fieldwork in agro-pastoral communities in highland Cusco, Peru, this study examines climate perceptions in terms of how local community members understand and explain changing climatic conditions. Specifically, two local climate narratives are identified and found to relate to Andean re-interpretations of Catholic and Evangelical religious traditions. The Andean practice of ritual offering to the earth (*pago a la tierra*) is found to play a key role both in the shifting religious identifications encountered at the local level, and in giving meaning to changing climatic conditions. The article further explores how these perspectives are rooted in diverging ontological and epistemological foundations. While in the local Catholic view the earth is conceived of as a non-human sacred/social person (*pachamama* or *Santa Tierra*) with whom a relationship of reciprocity must be maintained, the local Evangelical perspective instead conceives of the earth as an object, not a subject, more closely mirroring modernist Nature/Culture dualism. More broadly, the study suggests that how people interpret changing climatic conditions cannot simply be extracted and purified from the contexts of meaning production, and proposes the concept of 'entangled narratives' as a way of accounting for the social and cultural embeddedness of climate perceptions. Fulfilling our obligation to address climate change in socially just ways will require deepening our understanding of its human dimensions, including taking seriously what these changes may *mean* to the impacted groups.

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1. Introduction

That the human dimensions of climate change must be taken into account to understand and address this hypercomplex issue is increasingly recognized. To date, the social, cultural and political aspects of adaptation and vulnerability have drawn particular attention (e.g. Kelly and Adger, 2000; Eriksen and Kelly, 2007; O'Brien, Eriksen, Nygaard, and Schjolden, 2007; Ribot, 2010; Bassett and Fogelman, 2013). However, beyond assessing their vulnerability or adaptive capacity, how different groups understand climate-related problems and changes on their own terms constitutes an underdeveloped but emerging stream of empirical research. Anthropology has begun to address this question (e.g. Crate and Nuttall, 2009; Crate, 2011; Barnes et al., 2013) based on the premise that, 'culture frames the way people perceive, understand, experience, and respond to key elements of the worlds which they live in' (Roncoli, Crane and Orlove, 2009, pp. 87). Similarly, human geographers have called attention to how culture and values shape understandings of and responses to climate change (e.g. O'Brien, 2009; O'Brien and Wolf, 2010; Adger, Barnett, Brown, Marshall, and O'Brien, 2013). This work suggests that attention to diverse culture- and place- based understandings of environmental change is necessary to explain, 'why different groups exposed to the same sets of changes display vastly different responses' (Adger et al., 2013, pp. 113). Nevertheless, although their value and relevance are recognized in some quarters, local perspectives are still undervalued and poorly understood in global debates.

It is generally recognized that local knowledge can make unique contributions to understanding and responding to climate change (e.g. Reyes-García et al., 2016). However, research in this vein has tended to focus on comparing local perceptions with scientific sources of climate information (e.g. Luseno, McPeak, Barrett, Little, and Gebru, 2003; Wiid and Ziervogel, 2012; Mulenga, Wineman, and Sitko, 2017) rather than examining these perspectives on their

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own terms. In fact, a recent systematic review highlights the relative paucity of research delving into how changes are not only *perceived*[1] (in the strict sense of whether they are detected) but how they are *conceptualized and understood*, bringing to the fore the role of local cosmologies, ontologies, and epistemologies in interpreting these changes (Pyhälä et al., 2016). How people perceive (in the broader sense of understand or interpret) climatic changes is shaped by their broader concerns and priorities and how they identify with particular groups (e.g. Jurt, Burga, Vicuña, Huggel, and Orlove, 2015). It is also founded on the ontological and epistemological underpinnings of their worldviews, which may differ significantly from the dominant understanding upheld by climate science (Rosengren, 2016) and upon which mainstream responses to climate change are singularly based.

Further, while 'local perceptions' work to date has tended to present a single, homogeneous 'local' (Pyhälä et al., 2016, pp. 25), it is increasingly recognized that in the face of social and environmental change, 'responses can differ by gender, class, caste, and ethnicity; and these societal determinants impact adaptive capacity overall' (Bhattarai, Beilin and Ford, 2015, pp. 123). Such factors (but also others, such as worldview and religious affiliation) not only shape adaptive capacity, but more fundamentally frame how climate-related problems and changes are perceived and understood in the first place. This may vary significantly even within relatively small localities.

While research on the human dimensions of climate change is quickly gaining prominence, insights on the specifically interior dimensions[2], which include 'beliefs, understanding, morality, motivations, values, and worldviews' (O'Brien and Hochachka, 2010, pp. 94), is decidedly less prevalent. Specifically in relation to the focus of this article, how (diverse and changing) religious affiliations and beliefs inform local understandings of climatic and environmental change has received relatively little attention (cf. Watson and Kochore, 2012; Allison, 2015; Murphy, Tembo, Phiri, Yerokun, and Grummell, 2016; Gergan, 2017). While it has been generally recognized that religious beliefs and practices have practical, ecological consequences (even, explicit ecological functions) (e.g. Reichel-Dolmatoff, 1976; Allison, 2004), research on place-based understandings of climate in particular that incorporate interior dimensions, including especially how these relate to (religious) beliefs, is still limited (but see an overview by Allison, 2015).

Further, 'local perceptions of global environmental change' research in general is particularly limited in South America, and especially limited in the Andean region. A global review of 126 such articles by Pyhälä et al. (2016) identified only two in the Andes (Orlove, Chiang, and Crane, 2000; Boillat and Berkes, 2013; cited below), whereas the literature focuses more commonly on Africa, Asia, and North and Central America. Peru is particularly interesting for examining such questions because it is frequently cited as one of the most vulnerable countries, due in particular to impacts on glacial retreat and water availability in the Andes (e.g. Vuille et al., 2008; Bury et al., 2011), and because of its cultural diversity. In the Andean context signs used by local people to predict the weather have been studied to some extent. For example, researchers have identified local techniques based on the observation of the apparent brightness of constellations (Urton, 1981; Orlove, Chiang, and Crane, 2000; Rivière, 2002) and plant development and animal behavior (Rivière, 2002; Boillat and Berkes, 2013, pp. 5–6). Some of this work has focused on cataloguing and describing such signs (Urton, 1981; Rivière, 2002; Boillat and Berkes, 2013) or comparing local perceptions with scientific climate information (e.g. Orlove, Chiang, and Crane, 2000; Gurgiser et al., 2016). While this research is important, one can again note a tendency, as in the climate perceptions literature generally, to focus on *what* climatic changes are perceived rather than *how* those changes are interpreted and understood within a particular cosmology or system of beliefs.

In the Andean context, whereas Rosengren (2016) has documented how migrants from the Andean plateau fully embrace the scientific discourse on climate change, perspectives less congruent with this dominant view have been recorded elsewhere in the Andes. For example, the retreating glaciers of Mount Ausangate, considered an *apu* or mountain deity and important religious pilgrimage site, are interpreted as a sign foretelling the departure of the mountain god or even the end of the world (see Allison, 2015). In the Ecuadorian Andes, some indigenous farmers identify changes in climate and agricultural production as punishment from 'Mama Cotacachi', the volcano that dominates the local landscape (Rhoades, Zapata, and Aragundy, 2008, pp. 219–221). Other research has suggested that specific signs may be understood as divine messages (Rivière, 2002, pp. 366) or that climate-related problems such as hail and frost may be interpreted as the result of failures to maintain socially-mandated reciprocity relations (Berg, 1989, pp. 138–139; Rivière, 2002, pp. 360; Boillat and Berkes, 2013, pp. 6–7). More fundamentally, it has been argued that Andean perspectives on climate may challenge Western views of a Nature/Culture dichotomy (Paerregaard, 2013; Cometti, 2015). Nevertheless, research on how climatic changes are perceived from Andean perspectives and in relation to local religious beliefs is quite limited.

This paper begins to respond to many of these challenges by exploring how agro-pastoralists living in communities of rural Cusco, Peru understand the climate-related problems and changes they experience and how they relate these to religious beliefs and fundamental cosmological perspectives on human-environment relationships. The analysis underlines that local perspectives are by no means homogeneous, but that two prevalent narratives that fall along the lines of local Catholic and Evangelical Protestant beliefs can be identified. It is argued that these narratives are deeply embedded both socially and culturally, and are best understood not as ready-made climate narratives, but entangled narratives of climatic and cultural change.

Beyond contributing to our understanding of the perspectives of these particular groups, the paper seeks to highlight the broader importance of taking into account the cultural and social embeddedness of climate perceptions. In particular, it shows that even within the space of a small study area that may seem at first relatively homogenous in terms of livelihoods activities, cultural background, and historical trajectory, starkly contrasting understandings of the same climate phenomena may be encountered. This paper argues more generally that cultural values and beliefs influence understandings of climate, which will naturally shape individual and collective priorities and responses to climate change, and as such, must be taken seriously in adaptation research and practice if we are to address climate change in effective and socially just ways.

2. Methods

Ethnographic fieldwork was conducted in 2012–2013 in six agro-pastoral communities in Canas province, Cusco, Peru located

[1] As pointed out by an anonymous reviewer, 'perception' and 'understanding' are sometimes synonymous. Yet, the Oxford Living Dictionary contains two distinct definitions of the word perception – 'The ability to see, hear, or become aware of something through the senses,' and 'The way in which something is regarded, understood, or interpreted.' As argued here, much 'local perceptions of climate change' literature focuses on the first, asking questions about what changes are perceived by different groups (and often, evaluating the 'accuracy' of these perceptions vis-a-vis scientific climate data), rather than exploring how those changes are understood or interpreted in relation to particular cultural notions. This paper focuses on the latter.

[2] A term derived from Integral Theory, 'interior dimensions' refers to individual subjective experience as well as collective intersubjective factors influencing a person's perspectives and actions (O'Brien and Hochachka, 2010).

at around 4000 m elevation and above. The two narratives analyzed in this paper are based on 60 semi-structured interviews with community members, relating to livelihoods activities and perceived changes in production and climate-related problems. Interviews were conducted in Spanish and, with the help of an interpreter from a nearby town, Quechua. In an inductive way, specific questions (such as those related to *pago a la tierra,* explained below) were added to the interview guide during fieldwork as the importance of themes became apparent.

A narrative-based approach to qualitative data analysis was adopted. Narratives, as a specific type of discourse, are particularly relevant for studying perspectives on (socio-) environmental change given their temporal dimension, as they identify relationships between past, present, and (possible) futures (Cronon, 1992). From exploring competing narratives of glacial retreat (e.g. Cruikshank, 2001; Carey, 2010; Kaijser, 2013), to the role of narratives in community resilience (Gram-Hanssen, 2018), narrative approaches are finding increasing application in research on the human dimensions of climate change (Paschen and Ison, 2014; Fløttum and Gjerstad, 2017; Veland et al., 2018). Notably, as is increasingly recognized (e.g. Ingram, Ingram, and Lejano, 2015; Brown, 2017), narratives have a fundamental socio-cognitive function. They not only *reflect* individual and collective values, beliefs, and worldviews, but also, they *inform* everyday social practices and imagination, shaping the realm of perceived possibilities and alternatives, and may thus have material consequences (Veland et al., 2018). Examining how narratives both reflect and inform beliefs and practices is thus one key entry-point to engaging with the interior dimensions of climate change.

The qualitative data analysis method employed involved identifying key passages[3] in the interviews through an inductive-deductive approach, guided by pre-identified themes (deductive approach) related to views on and explanations for climate-related problems and changes, but leaving space for the emergence (inductive approach) of new themes introduced by study participants during the interviews. This stage of the analysis permitted the identification of relevant passages and confirmed at least that a relationship existed between views on and explanations for climate-related problems on the one hand and religious beliefs and identification on the other. However, while this approach allows bringing thematically-related coded text segments together for comparison across interviews, it tends to lead to a fragmented, text-out-of-context perspective. This made it difficult to get a picture of the 'whole story' of the relationships between what were, as it became apparent, fundamentally entangled themes. In the final analysis, these key text segments were re-examined in their original context (the full interviews). For this analytical stage a more holistic 'narrative interpretative lens' approach involved further close reading while posing questions such as 'what is the story about' and 'why is this particular story being told, and not another' (along the lines of Spector-Mersel, 2014, pp. 4–5; Spector-Mersel, 2010). Through this process, two distinct narratives, weaving together climate-related problems and changes with religious affiliation and beliefs, could be discerned, as described below.

As a caveat, it should be emphasized that the variety of interviewee responses suggest that local perceptions are in fact more diverse, complex and contingent than this representation can depict. Despite this coarse-grained level of detail, the hope is nevertheless to convey some sense of the character of local perceptions and the principal organizing function played by diverse religious beliefs and practices.

[3] I used MAXQDA's basic coding and retrieval functions, but any CAQDAS would have sufficed, including free software or indeed coding by hand. Manuals on coding exist (see e.g. Saldaña, 2009), but it is often understood as something one learns by doing (and re-doing).

3. Local Catholicism and Evangelicalism

Local explanations for climate-related problems and changes relied heavily on local Andean re-interpretations of Catholic and Evangelical religious beliefs. Before presenting the two identified narratives in Section 4, it is therefore important to understand the relevance of religious affiliation in the study area, which is the purpose of this section. As one arguement of the paper is that context matters, presenting these key elements of the context is crucial.

3.1. Religious affiliation and the arrival of Evangelical Protestantism

Like the rest of Latin America, Peru is predominantly Catholic, yet the expansion of Protestantism, particularly Evangelical Protestantism spread from the United States into Latin America has led to significant conversions (e.g. Martin, 1993), in particular since about 1970 (Esquivel, 2017, pp. 10). A similar trend is found in the local communities under study. While Evangelical missionaries are thought to have entered the Cusco area by the end of the 19th century and were established in Canas province by the 1930s[4], according to respondents, evangelization in the study area began in earnest in the 1970s.

In the 2007 national census (INEI, 2008), over 12% of the Peruvian population identified as 'Evangelical,' although the proportion is higher in many rural areas. In the two districts where the communities studied are located, 19 and 27% of the population identified as Evangelical (vs. 76 and 71%, Catholic)[5]. While I did not collect statistics of religious affiliation, these figures seem to reflect at least approximately the situation during fieldwork in 2012–2013, when Evangelicals constituted a significant portion of each of the communities studied.

In the communities, the term *hermanos* (brothers) is often used to refer to Evangelicals generally (see also Allen, 2002, pp. 220), yet many self-identified Catholics used simply the terms *religión* or *los religiosos* to refer to Evangelicalism and Evangelicals, with an apparent connotation of 'religious fanatic.' In fact, no one in the study area referred to Catholicism as 'religion.'[6] Every reference to 'religion' in the interview excerpts in this paper should thus be understood to refer to Evangelical Protestantism.

3.2. Pago a la tierra – A key ritual practice and point of contention

Throughout interviews with respondents, a key theme emerged that links together discussions of religious affiliation and climate-related problems and changes and is fundamental to understanding the narratives discussed below. This is the practice of *pago a la tierra* (literally, payment to the earth), or simply *pago*[7]. *Pago* is generally understood as a ritual offering to traditional Andean earth beings, including the *apus* (mountains) and *pachamama* (commonly translated as 'mother earth', however, 'earth' has multiple and complex meanings, as addressed in the discussion section). In the study area, *pagos* consist, materially, in the careful preparation and burning of an offering bundle, typically containing three primary ingredients – corn, coca leaves, and alcohol (cf. Allen, 2002, pp. 129–130). The ritual is performed during important moments of the agricultural

[4] Using dates estimated by Olson (2006) for Canas province due to lack of written records.

[5] 3% and 1%, other; 2% and 1%, none. The INEI only provides statistics for these four categories (Catholic, Evangelical, other, none).

[6] This may be for two reasons – the perception of Catholicism as the traditionally-dominant, 'default' or unmarked category, thus requiring no label (in a similar way that 'race' rarely means 'white', see e.g. Brekhus, 1998); and, because the term 'religion' may in fact poorly describe local practices and beliefs (see De la Cadena, 2015, pp. 95), a point that has not been engaged due to space limitations.

[7] Also referred to as *despacho* in Spanish, referring to the idea that the offering is 'sent' to the earth deity (e.g. Allen, 2002, pp. 129), or in Quechua, *haywarisqa*.

and pastoral calendar, in particular during *carnaval* in February and on August 1[8]. As a ritual practice, *pago* in itself does not imply a fixed set of beliefs. Rather, in making sense of this practice, community members refer to 'traditional' Andean, Catholic, and Evangelical beliefs, and a considerable margin for interpretation and crossover between belief systems exists. There is not a single 'syncretic' Andean Catholicism or Evangelicalism. Yet, as discussed below, attitudes toward *pago* define rather dichotomously what 'being Catholic' and 'being Evangelical' mean in the study area.

While its meaning and performance has evolved over time, *pago* is a pre-Christian and probably pre-Inca ritual practice (e.g. Marzal, 1994, pp. 146) performed throughout the Andes to varying degrees. Traditionally, in the study area *pagos* would take place during a collective *carnaval* ceremony and festival.[9] Although it is now practiced mostly individually, when it was performed in a wider group, collective *pago* ceremonies were directed by an officiant – the *curaca*[10] – whose duties included organizing *carnaval* participants, designating a site on a prominent hill, and carrying out the ritual ceremony itself (Interview #21).

Today, at least in this study context, *pago* is an integral part of the local Andean version of Catholicism. Crucially, as in other areas of the Andes, converts to Evangelical Protestantism abstain from the practice, especially, due to the use of alcohol (see e.g. Magny, 2009; Olson, 2006; Allen, 2009). Many self-identified Catholics cite the arrival of Evangelical Protestantism (again, often referred to simply as 'religion') as the cause of the recent decline in the practice of *pagos*, in its individual and especially in its collective form. In fact, while a number of respondents recalled elements of the collective *pago* ceremony, the related festivities, and the central role of the *curaca* in organizing the festival and performing the rites, these stories were always in the past tense:

> There used to be *curacas*. The *curacas* prepared the earth, the hill. They walked with their black *bayeta* suit[11] [...] In the festivals, seated at the ritual table, with his *chicha* [maize beer], a bottle. They would drink together. When visitors came – surely they came from other communities – so they chewed their coca together. Yes, [they had] more respect. My father was also involved in these responsibilities and assisted the *curaca*. That's it; now that doesn't exist anymore.
>
> —And why have they disappeared?
>
> Because of religion. (Interview #14)

While stated here implicitly ('religion'), this interviewee later specifically identifies Evangelical conversion of some community members beginning in the 1960s and '70s as the beginning of the decline in collective *pago* performances. Other respondents similarly seemed to regret the arrival of Evangelicalism and the falling out of practice of *pagos*:

> I don't [perform *pagos*] anymore. Oh, how much I would like to, but unfortunately, my fellow community members don't do it now, and they set an example for me. So, the community members, my brothers[12], aren't doing it, so I am afraid to myself (laughing). (Interview #38)

A number of other interviewees explained that they do not (or no longer) perform *pagos*, because they are now 'believers' (Interview #13), or they 'know the Bible' (Interview #48; Interview #9), referring implicitly to their conversion to Evangelicalism. Two interviewees, when asked if they performed *pagos*, responded directly, 'no, I'm Evangelical' (Interview #2; Interview #12), whereas Catholics explained that they continue to do *pagos* 'because they are Catholic' (Interview #7). In short, in the study area, a key marker of difference between Catholics and Evangelicals is performing or not performing *pagos*, and, as discussed below, this turns in particular on attitudes toward the associated use of alcohol.

3.3. Motivations for conversion

Expressed motivations for Evangelical conversion and for stopping the practice of *pagos* were remarkably consistent across different communities. It was commonly stated that *pagos* and the related festivities contributed to alcoholism, with associated problems of abuse and redirection of family finances to alcohol. Although given less attention in the literature than the use of coca leaves, the importance of alcohol in *carnavales*, *pagos*, and other ceremonies is well-documented (e.g. Flores Ochoa, 1977, pp. 213–214, 220–223; Allen, 1982; Jennings and Bowser, 2009; Magny, 2009). Alcohol plays an important role not only as one of the ingredients of the offering itself. *Pago* ceremonies are accompanied by frequent libations to the earth and ritualized social drinking. As Catherine Allen explains, '[t]hrough repeated offerings of chicha, the powerful and omnipresent Earth and sacred places are satisfied, placated, and drawn into the festivities. [...] Excessive drinking is what makes the ritual "work," for this collective outpouring of spirits animates and gladdens the living Earth' (Allen, 2009, pp. 37). In many interviews, *pago*, religious affiliation, and use of alcohol were closely linked. In fact, any question about *pagos* almost invariably led to a discussion of religious affiliation and alcohol. For example,

> —Do you perform *pago a la tierra?*
>
> Before, my father did *pagos*. He did them in August, first of August. For two days my father drank, killed a sheep and cow and on the second day, llama. [...] A week before, my mother prepared *chicha*. My father traveled to Acomayo to bring back yellow corn. On the first day, visitors came. They would drink *chicha*, prepare the roast and *cañihua* flour, and begin to put earrings on the llama.

[8] In the southern central Andes, August marks the transition from the cold, dry season to the warm, rainy season and is thus an appropriate time for sowing seeds to avoid nighttime frosts and maximize the growing period. In relation to this, August 1 in particular is understood as a moment when *pachamama* is 'open' or 'hungry' and requires feeding through *pagos* (see e.g. Mariscotti, 1966).

[9] For a close-to-the-text Quechua-French translation of a description of the traditional practice in Canas, see Dumézil and Alencastre (1953, pp. 38–63).

[10] This meaning for *curaca* contrasts with a common description from the literature as a local governor who intermediated between the Inca and the ayllus (e.g. Wachtel, 1977, pp. 61–84; Alberti and Mayer, 1974, pp. 17). Perhaps a related word, '*quraq*' (or '*kuraq*') refers to the elder of the family (Runasimi, 2006). However, from the recorded interviews it seems that the respondents are indeed using the word '*curaca*,' rather than '*quraq*.' Historically there may be some overlap between the two concepts. In the case of some Aymara communities in Bolivia, Rivière (2002, pp. 362–363) suggests that certain officials are appointed for one year and perform overlapping political and ceremonial functions. Flores Ochoa (1977, pp. 215) refers to the *quraq* as the eldest man whose role it is to direct ceremonies, which likely refers to the same role as '*curaca*' described by respondents in this study. Similarly, in a description of the *carnaval* from the nearby community of Langui, the ceremony is directed by the '*kuraq*' (translated as 'eldest') but is also referred to as '*wasiyuq runa*' (the host) who is said to preside over the ceremony in the place of a ritual specialist ('*paqo*') (Dumézil and Alencastre, 1953, pp. 39, 45, 49). In the case study zone, no mention was made of shamans or other lifelong ritual specialists; rather, the *curaca* seems to have been an important but temporary role with ceremonial duties taken up by the head of a household.

[11] In the Andes, *bayeta* refers to a hand-woven wool fabric. As a traditional cloth, it may represent indigenousness (Fermenías, 2005, pp. 158–161). Given the negative opinions expressed by this interviewee about Protestant evangelizing and other elements from the 'modern' world, it was perhaps significant to him that the *curaca*'s suit was made of *bayeta* rather than, say, machine-made or imported fabrics which are now commonly worn in the community. Some examples of traditional *bayeta* clothing from nearby Puno can be found in Huargaya Quispe (2014).

[12] In this case it is not clear whether the interviewee is referring to his own biological brothers or to the Evangelical converts. Certainly conflicts exist between Evangelical and Catholic family and community members, as other informants explained.

> Me, yes, I did do offerings myself for a time. I did it for two years but I got sick. And then some *hermanos* came. They prepared a *mate* for me and told me that what I had done had made me sick. [...] I am doing okay with my family now. Before I used to drink a lot of alcohol. Before I would drink a lot, I would go crazy, hit my wife, insult people, but not now, no. Meeting the *hermanos*, they said to me 'why are you like that?', and now I go to church. (Interview #37)

Another interviewee responded with similar honesty and explained that now that he has 'read the word of God' (i.e. converted to Evangelicalism) he no longer performs *pagos* nor does he drink like he used to. Another explicitly stated that their family became Evangelicals (and stopped performing *pagos*) because 'there was a lot of drunkenness,' whereas now the money that was spent on alcohol is dedicated to children's education. Others likewise cited the importance of costs involved in *pagos*, in particular in providing food and alcohol to the guests, even referring to the practice as *gastadera*, i.e. a significant waste (Interview #48).

> Science advances and really this *pago a la tierra* brings expenses. Really, with what I am living with now, I can't do anything. I don't pay anything. The earth is *tranquila* [not agitated]. Before, I was wasting in vain because you have to buy the best ears of corn, a sheep. They throw out coca, alcohol, and get drunk with that. This is a futile investment because in giving to your child [i.e. by instead investing resources in the family], at least you get a kilo of sugar for the family, but in burning all that – nothing [...] wasting, burning potatoes, coca, in vain, *por gusto* [for the fun of it]. (Interview #23)

For indigenous people of the Andes to describe *pagos* in such terms (waste, in vain) signals a significant shift in local meanings, at least for these Evangelical converts.

The majority of Evangelicals I spoke with referred to the social obligation of alcohol consumption in relation to *pagos*, alcoholism, and associated problems (abuse, abandonment) in explaining the motivation for their conversion. Allen goes so far as to describe Protestant conversion in the Andes as, 'a sort of local version of Alcoholics Anonymous, as reforming alcoholics and their families provide each other support, discipline, and encouragement' (Allen, 2009, pp. 30). In a few explicit cases in this study, women explained that they had pushed their husbands to convert to escape the latter's alcoholic behaviour (see also Allen, 2002, pp. 221). This has been observed in similar cases in Andean communities undergoing significant conversions (Magny, 2009; Olson, 2006; Allen, 2009)[13].

In short, local Evangelical views on *pagos* contrast sharply with the key role that these offerings to the earth play in the social and ritual lives of local Catholics. This section has underlined that local community members in the study area readily identify themselves along Catholic/Evangelical lines and that key characteristics that permit the distinction between Catholics and Evangelicals are the practice or rejection of *pago a la tierra*, and in particular the use of or abstinence from alcohol.

4. Two local narratives of climate-related problems and changes

Why, in a paper about climate change, are we talking about Catholicism, Evangelicalism, and, even, alcoholism? In the following two sub-sections two local 'climate narratives' will be identified, both of which make direct reference to differing religious beliefs, the *pago* ritual, and the use of alcohol in particular. As explained in this section, these different, faith-based perspectives on the appropriateness of *pago* and alcohol have remarkably important implications in terms of community members' interpretations and responses to climate-related problems and changes and their relationship with the environment more generally.

Local narratives were identified through analysis of interviewee comments related to livelihoods practices, how agro-pastoralists explain climate-related problems and changes they experience, and how they respond to these. In their livelihoods practices, informants depend primarily on potato crops (for sustenance) and on raising cattle (for cash income through sale of milk and live animals, eventually for meat production) as well as other livestock (sheep, alpaca, llamas). Harsh climatic conditions have always been a part of agro-pastoral activities in the Andes. In the interviews, community members identified a number of climate-related factors and the direct and indirect effects that these have on their livelihoods (Table 1). Among these, hail and frost were the most frequently mentioned and identified as the most problematic, with impacts on both sustenance (potatoes) and cash-oriented (livestock) activities. Informants rarely referred to the 'climate' in abstract terms, but rather either identified specific problems and factors such as those presented in Table 1, or referred to their relationship with 'the earth' more holistically, with these specific issues being understood as part of that relationship.

It is tempting to interpret these results as evidence of 'local perception (i.e. detection) of climate change.' Indeed, a number of interviewees did mention increasingly problematic climate conditions (in particular, related to heat and cold extremes, solar irradiation, decreased water availability, and concentration of rainfall in shorter, more significant bursts) on the time scale of generations. *However*, a number of other interviewees on the contrary reported improved or unchanged climatic conditions, even in relation to the same variables and within very small geographical distances. Generally, there was not sufficiently consistent agreement on which to base any conclusions about how local climatic variables are actually changing. Given that this was a qualitative study based on semi-structured interviews with a small number of respondents, it cannot be concluded from this study alone that local community members 'are experiencing climate change impacts.'[14]

In any case, this was not the purpose of the study. Going back to the distinction made in the introduction, the objective is to explore not only *what* changes may be detected, but *how* local community members experience, explain and respond to climate-related problems and changes, and what narratives may be emerging and crystallizing at the local level. The next two subsections identify the contents of two local climate narratives, whereas in the following discussion section I will elaborate on how these two narratives fit within broader, evolving perspectives on human-environment relations more generally.

4.1. Denying the earth its due – the local Catholic climate narrative

One local narrative on climate-related problems and changes espoused by self-identified Catholics explains negative climatic problems and changes as the result of failing to perform *pagos*. In this narrative, the traditional function of *pagos* as an important way of maintaining positive reciprocal relationships with the environment is emphasized. Maintaining 'good relations' with the earth in this way is seen as crucial for avoiding problems like cattle sickness and crop losses, as well as for being able to notice key weather-related signs in the environment. According to this

[13] In Allen's fieldwork, she noted that Evangelical converts initially continued to perform *pagos* but used soda pop as a substitute for alcohol both in offering to the earth and in the related festivities. Eventually, however, they stopped performing *pagos* altogether (Allen, 2009).

[14] Work elsewhere in the Andes suggests indigenous people clearly identify unequivocal and dramatic climatic changes, such as significant changes in rainfall patterns, drought, and hail (Bolin, 2009).

Table 1
Qualitative overview of climate-related problems and changes mentioned by interviewees.

Climate-related factor	Effects on livelihoods indicated by interviewees
Hail	Crop loss, livestock disease
Frost	Crop loss, livestock disease
Heat extremes	Pasture drying
Cold extremes	Livestock diseases
Excessive solar irradiation	Pasture drying
Concentration of rainfall	Crop production unpredictability
Water availability	Primary factor limiting 'improvement' (e.g. cultivated pastures)

narrative, it is because people (especially Evangelicals) have abandoned *pago a la tierra* that the community is experiencing problematic and unpredictable climatic conditions. One extract from an interview demonstrates this particularly well:

> Before, when I was a boy, there were *qollana*[15] who descended from the sky to the earth, in a place beyond Checca, and we would bring them a sheep on December 25th. On that date, people paid an offering for the first of January.
>
> The harvest used to be abundant, then when people stopped offering, everything went away – frost, frost.
>
> —When they stopped offering the frost came?
>
> Yes, to this day.
>
> —How many years ago was this?
>
> People used to offer every year. In Checca there were *curacas* and in the 60's more or less people were still offering. In the 70's and 80's no. In the 2000's – ¡*ni pensar ya!* [forget about it!]. (Interview #14)

This interviewee later goes on to describe how he continues to perform *pagos* but only on an individual scale, and links the fact that he 'paid well' with the good production he enjoyed this year. Informants also mentioned the risks of not performing *pagos*: 'For the earth it is good [...] We are walking on the earth after all – yes it is useful – we are talking, we are walking on the earth [...] When you don't give to the earth, your cow gets sick' (Interview #7).

According to informants, what is received by humans in this reciprocal relationship with the environment and maintained through *pagos* is not only good production or avoiding problems, but also signs for predicting the weather. One respondent (Interview #14) who was asked whether there were people who could predict a good or bad harvest replied that, 'before there were many, they measured the weather. Not anymore. Religion has destroyed everything. Now there are many religions [Evangelicals] and there are no more Catholics, only a few.' When asked specifically whether he thought the climate was going to improve or get worse, he replied, 'I think... I can't decide because *el Alto* [God] knows how it will be, Jesus Christ knows all. We can all just comment on it.' Nevertheless, this interviewee then went on to predict that there would be sufficient rainfall for planting and good harvest this year because of two signs he had seen: the presence and good appearance ('*verdecito, bacán*') of a kind of algae (*laqu*) in the river, and the fact that he had seen, just that morning, that a stone had 'walked' in the sand about 20 cm. He explained that, 'for some of us this means something, for others, no. Before, everyone could see that, now with religion, *nada que ver* [there is no comparison]'. Similar kinds of weather prediction signs in the Andes have been described by others, as discussed in the introduction. What is more relevant here is the local perception that the faltering usefulness of these signs or lack of ability to interpret them is attributed to evangelization.

Some respondents continue to keep up the practice on an individual scale, and maintain that *pagos* are an effective way of ensuring good production and avoiding problems like hail, frost and sick cattle. Yet, often, respondents seemed reluctant to discuss the details of *pagos* or admit that they still perform them. In one case, the interviewee seems at times unwilling even to mention *pago* and instead refers to it repeatedly as *esas cosas,* 'those things':

> —There aren't any problems in potato production?
>
> No problems, except that the potato doesn't grow, but what are we going to do? Our Lord doesn't wish it. We have no food, few potatoes.
>
> —Why are there so few potatoes?
>
> I don't know, with the hail and the frost... In the rainy months – January, February and March – there is a lot of hail, so when the potato plants are blooming they all get 'burnt', as if you threw a rock at them. So the potatoes don't grow, only a few.
>
> —And before, this used to happen with the hail?
>
> No, this didn't used to happen because there was good harvest, because they [our ancestors] used to love our earth. They used to do 'all those things'. But now science has changed many things. So now we don't do 'those things', they say... I don't know how it would be... I can't really tell you 'all those little things'.
>
> —What isn't done anymore?
>
> Well, they used to do an *haywarisqa*, a *pago* to the *Santa Tierra*.[16] At everyone's house, in the *carnaval* months, in February, they would do that. We would burn our corn, our coca leaves, our... We did all that – when I was young, not anymore. In those days, we would scamper around on horses, *pucha*[17], at everyone's house.
>
> Now that has disappeared, it doesn't exist anymore. In those days, our great grandparents loved and believed a lot. But now the religions have arrived. Now 'those things' no longer exist, year by year they are disappearing. (Interview #38)

There are clear indications of reluctance to talk about *pagos*. Elsewhere in the same interview, the informant clearly stated that he no longer performs *pagos* due to the 'example' set by others in his community. It is likely that this interviewee feels social pressure from Evangelical community members or from within his own family to abstain from performing *pagos* (and perhaps, specifically, from using alcohol, the unmentioned third ingredient: 'we would burn our corn, our coca leaves, our...'). Whatever the case, the informant clearly attributes the decline in potato production to the loss of practice of *pagos*, which in turn is attributed to the arrival of Evangelicalism. Yet, this self-identified Catholic informant and others (Interviews #8 and #43) referred to hail, frost, and increasing cattle disease as punishment (*castigo*) from God, but as described in the above extract, ultimately as a consequence of the loss of love for the earth (i.e. through *pagos*). The specific relationship between humans, God and the earth in local Catholic belief will be developed in the discussion section.

[15] The *qollana* are traditional (perhaps pre-Columbian) religious authorities with particular importance in directing water-related rituals, including for the purposes of rainmaking. Some, with magical abilities, could be considered shamans. (Personal communication from Alex Álvarez). This was the only interviewee to mention *qollana*. All other interviewees referred only to the role of the *curaca*. Mariscotti (1978, pp. 152–154) describes the role of the *qollana* as a sort of 'master of ceremonies' who organizes and presides over planting and harvest work parties, a yearly-elected position, perhaps similar to the *curaca* described here.

[16] A specific reference to the sacred/social earth, see discussion section.

[17] Expletive interjection to express emphasis.

Other research in the Peruvian Andes has pointed in similar directions. For example, Jurt et al. (2015, pp. 519) note that some residents attributed the retreat of nearby glaciers to the abandonment of traditional offerings to the mountains (or *apus*, which have a similar ontological status as *pachamama* in traditional Andean belief). Bolin suggests that in her study areas, also in the Cusco region, 'some indigenous people have wondered what they have done wrong to deserve the wrath of the gods' (Bolin, 2009, pp. 232). More specifically, Paerregaard (2013) has chronicled shifts in religious beliefs and practices over the past three decades, finding that Protestant evangelization has contributed to faltering belief in the efficacy of *pagos* among some villagers, while others explain the anger of the mountains (as evidenced by recent water scarcity) as the result of Evangelicals' failure to participate in offering ceremonies. Similarly, Allen refers to the split opinions on ritual offerings between Catholics and Evangelicals in her study area as 'the great divide' (2002, 243). According to a traditional perspective, '[w]ithout the offerings, the Earth and the sacred places get hungry, sad, and angry; luck turns bad, animals die, and crops fail' (Allen, 2009, pp. 44), a perception that very closely mirrors the statements of local Catholics in this study.

Through these and other responses by interviewees, a local narrative explaining changing climatic conditions can be discerned, whereby the failure to perform *pagos* has resulted in problems like increased hail and cattle sickness, as well as the lost ability to read signs to predict the weather. Despite a significant number of Evangelical converts in the communities, many Catholic respondents continue to perform *pago* offerings albeit on an individual scale. How this narrative can be understood within an overall view of reciprocity with a sacred/social environment will be elaborated in the discussion section.

4.2. 'This is the way the world will end'[18] – the local Evangelical climate narrative

A second local narrative, rooted in local Evangelical beliefs, interprets changing climatic conditions as signs of the end of the world drawing near. Andean eschatological beliefs have a complex history. Authors tend to suggest that contemporary references to the end times relate to the Andean conception of *pachakuti*[19], understood as a 'transformation on the empirical-contingent plane' (Hardy, 1975, pp. 262). Generally, this is considered a sort of revolution that replaces the current time, world, or order with a new one (e.g. Allen, 1993, pp. 89–90; Marzal, 1994, pp. 152; MacCormack, 1988; Mannheim, 1991, pp. 92). According to Hardy's (1975) review of case studies in the Andean context, '[e]ven where seemingly Christian categories are employed, the structural pattern remains that of the cyclic cosmic conception of the Andeans' (262), suggesting that Christian terms such as 'Last Judgment' are used as a mere 'cover' for the enduring and presumed 'pure' conception of *pachakuti*.[20]

The interviews conducted during fieldwork in this study area suggest another interpretation. Many interviewees did express a concern that weather patterns were shifting from what they had experienced as 'normal' to patterns that they found excessive, unpredictable and erratic, suggesting a perceived loss of order. However, despite possible pre-Christian roots in Andean eschatological beliefs, most interviewees who talked about the end of the world used the term '*el fin del mundo*', and referred specifically to their Evangelical faith and to end-time descriptions in the Bible.[21] Whether, to them, this means the 'end of the world' or, somewhat less drastically, the 'end of the world as we know it,' that is, the end of the current natural and social order, is less clear.[22]

For example, when asked to explain changes in the rainy season she had described, one woman replied, 'Our Lord determines the weather. The Lord himself, the Bible says that when the end of the world approaches, there is no water, there is no rain, there is no *chakra* [agriculture/food]' (Interview #16). Another interviewee who was asked to explain the cause of new diseases and a worm affecting potato production explained,

> I don't know, I can't say where it comes from, what causes it. But it must be – as I am an Evangelical – in the Bible it says that these kinds of diseases must appear in the final times, in the final days. That's what I think. (Interview #2)

Other interviewees similarly said that everything is occurring as it is written in the Bible (Interview #9), or explained worsening cold, snows, rain, and cattle disease as signs of the ending of time (Interview #55). A study in very nearby communities (Flores Moreno, 2014), although putting less explicit emphasis on the role of diverging Catholic and Evangelical religious beliefs and affiliations, found that similar explanations regarding climatic changes as signs of the end times were expressed by Evangelical converts.

One peculiar feature of this narrative is that it links climate-related problems and changes to an apparent shortening or quickening of the passage of time. As one interviewee put it, 'before time did not go by, the days were long. Now, no, quickly the days, weeks, years go by' (Interview #9). Another self-identified Evangelical informant indicated that the weather changes she described (colder, sun burning like fire) could not go back to the way they were before and immediately added that, 'the month is like a week, the week like a day... time is passing very quickly. Before the years couldn't go by; not any longer' (Interview #13). That is, for at least this interviewee, there is a logical connection between changing climatic conditions, quicker time, and the irreversibility of those changes. Other informants likewise explained changes in climate such as worsening cold spells or excessive heat impeding pasture growth in terms of time shortening, repeating the use of a fixed phrase, '*el tiempo se está acortando* [time is getting shorter]' (Interviews #55 and #32). The quickening of time in the 'end days' is not, to my knowledge, a common part of either Christian or pre-Christian Andean eschatology, nor did a review of the

[18] Interview #30.

[19] *Pacha* is typically translated as 'earth' (e.g. in *pachamama*). Yet, *pacha* in fact has an important double meaning that refers to both space and time. It can be translated as any one of: 'earth; world; age; era; time; soil; space; nature; environment; place' (Runasimi, 2006, see also Ossio, 2002, pp. 208; Allen, 1993, pp. 89–90). *Kuti* also has a number of different meanings, many related in different ways to an idea of reversal or upheaval. *Pachakuti*, then can be interpreted as 'world reversal' or 'turning of the era.'

[20] The importance of the *pachakuti* concept in the Andean conception of time before the colonial era is unknown. It is postulated that the Spanish conquest itself may have represented such a cataclysmic upheaval of the Andean world order as to heighten the pertinence of the concept and lead to a more codified re-interpretation of Andean history (and future) in terms of a series of cycles or 'orders', a history punctuated by *pachakuti*, cataclysmic reversals of the established order and replacement by a new one. This approach is typified in the well-known (and already highly Christianized) writings of Guaman Poma, who divided the history of the world into a series of 5 eras, the last ending with the Spanish conquest and fall of the Inca empire. (see MacCormack, 1988, pp. 966–967)

[21] As a possible middle position, Steele (2004) suggests that the Andean conception of *pachakuti*, 'resonates with the idea of Judgment Day as expected by Pentecostal Protestants, a similarity that may have contributed to the rapid spread of Protestantism' (pp. 228).

[22] It could be noted in passing that apocalyptic imagery associated with climate change is not absent from Western media and discourse either, and we too grapple to comprehend the extent and nature of the expected changes. An opinion poll on climate change in the U.S. focusing specifically on religious beliefs found that while 62% of Americans attributed 'the severity of recent natural disasters' to climate change, 49% attributed it to 'the "end times" as described in the Bible.' White evangelical Protestants were the subgroup most likely to attribute natural disasters to the 'end times,' a full 77% (Jones, Cox, and Navarro-Rivera, 2014, pp. 23). That evangelical discourse in South America is heavily influenced by prominent evangelical figures in the U.S. (Olson, 2006) may be part of the connection.

literature find any reference to this belief.[23] Suffice it to say, for these interviewees at least, time quickening, along with changing climatic conditions, is interpreted as a sign of the coming end of the world, whether this is a widely-held 'Christian' or 'Andean' belief or not.

Many self-identified Evangelicals stated that there was nothing that could be done about climate-related problems and changes, which is understandable if these are interpreted as signs of the end of the world. Yet, when asked about responses to specific problems like hail and frost, most admitted that some specific techniques could be used. Apart from 'practical' techniques like anti-hail rockets (which are used elsewhere in the world), the role of prayer and reading the Bible was highlighted by several Evangelicals. For example, when asked how to deal with hail, one informant explained:

> We buy those little flying rockets and we defend ourselves [from hail] with that. Sometimes through the Lord's words. Each of us has our Bible – some of us don't drink anymore – so with the Bible, in that moment we ask the Lord Creator, we read the Bible and sometimes [the hail] calms down a bit. (Interview #48)

In many cases it seemed as if practices of Evangelical faith, in particular the central importance of the Bible were understood as a kind of replacement for the *pago* ritual. When this self-identified Evangelical was asked whether he still performs *pagos*, he replied:

> I used to make offerings, but not anymore because I have a Bible. I ask the Lord, read my Bible, and don't do *pago* [...] I don't offer anything, just the words of the Lord [...] And I go to the Pentecostal church in the district of Checca. I go there and a man we call '*pastos*'[24] explains to us, 'as people, we shouldn't envy our neighbors', and so on, about everything that is in the Bible and he explains it to us. 'Gloria, Gloria, Gloria! In the name of the Lord, get out of here filthy Satan', so he says, 'hell devil, get out of your house, out of your fields.' I go, and I come back peaceful. My wife also goes to the church in Sicuani [...] She is baptized; she doesn't even chew coca. Me, yes, I have my coca, but I don't drink anymore. Some of us are like that, others continue, the majority continue to do *pagos*.[25] (Interview #48)

It is notable how different themes are interwoven in this response – Evangelical faith, *pagos*, alcohol, and hail. This interweaving of themes will be taken up in the discussion section where I introduce the concept of entangled narratives.

What is highlighted here is the way that practices of Evangelical faith including reading the Bible, prayer, and church services are put in parallel to and seem to directly replace the *pago* ritual. In relation to this, the final remarks of the interviewee further underline that there are two ways of living. On one hand, there is the Catholic way – protecting against problems and preparing for good harvests through *pagos*; on the other hand, there is the Evangelical way – avoiding problems through reading the Bible, attending church, being baptized, and abstaining from alcohol. Both ways of living fulfill practical and ritual needs of responding to weather events and ensuring agricultural productivity but in different ways.

5. Discussion

I have briefly described the contents of two competing local narratives on changing climatic conditions and their relationship to local Catholic and Evangelical beliefs. This discussion seeks to extend the analysis a step further by elaborating on two main themes that emerged through the interviews. First, I trace how these narratives are based on two competing interpretations of human-environment relationships. Second, I introduce the concept of entangled narratives as a way of accounting for how climate perceptions are embedded within ongoing social and cultural processes.

5.1. Santa Tierra – The sacred, social earth

Two concepts are relevant for a discussion of the relationships that self-identified Catholics maintain with their environment – reciprocity and personhood. Although the two concepts are sometimes discussed separately, I believe they are closely related, at least in this particular context. First, reciprocity[26] is commonly recognized as an organizing principle of relationality in the Andes (e.g. Bolin, 1998; Allen, 2002, pp. 72–74). It is a system of norms that regulates exchange between persons (e.g. Mayer, 2002, pp. 105; see also Alberti and Mayer, 1974), but it is important to understand that the 'persons' thus related are not only human beings, but rather,

> Every category of being, at every level, participates in this cosmic circulation. Humans maintain interactive reciprocity relationships, not only with each other but also with their animals, their houses, their potato fields, the earth, and the sacred places in their landscape. (Allen, 1997, pp. 76; see also Bolin, 1998)

As such, reciprocity regulates a system whereby, 'relations between humans, as well as the relations between humans and non-humans, are fueled by a constant exchange of services, souls, food or generic vitality. The dominant belief in such systems is that humans have a debt towards non-humans, notably for the food the latter provide' (Descola, 1996, pp. 94). As such, at a basic level, reciprocity explains the relevance and function of *pago a la tierra* – an offering or payment to the earth in exchange for or recognition of life's sustenance.

Such systems are not unique to the Andes. In Southeast Asia, Dove and Kammen (1997) describe reciprocal relations with the environment as the inclusion of humans and nature within a single 'moral ecology,' which they suggest is a well-adapted system for dealing with highly-variable production in unpredictable ecosystems. Closer to the field of this study, in Mexico, Salmón (2000) describes the human-environment relationship in terms of a 'kin-centric ecology', the norms of which require mutual nourishment and reciprocal care between humans and 'natural elements.' In this system, maize beer rituals are necessary for maintaining relationships with the earth and bringing rain (ibid).

Interrogating and extending the concept of the 'person' is one avenue toward understanding systems in which humans engage in reciprocity relationships with non-human elements of their environment. As Bird-David (1999) explains, the modernist view is founded on a human/non-human dichotomy (cf. nature-culture dualism, Descola, 2015), and as such, a 'person' is necessarily a

[23] Time quickening before the end days is however mentioned in Islamic Hadith, where one of the signs of the end is, 'when a year feels like a month, a month like a week, a week like a day, a day like an hour, and an hour like the small amount of time it takes for a palm leaf to burn to ashes' (Stowasser, 2002, 3). The similar formulation is striking.

[24] *Pastos* means pastures. The interviewee is almost certainly referring to the Protestant *pastor*.

[25] The quote can admittedly be interpreted in different ways, but I believe the interviewee is saying, 'Some of us are like that [some of us in the community don't drink or perform *pagos* i.e. are Evangelicals], others continue, the majority continue to do *pagos* [i.e. are Catholics]'. This interpretation is consistent with the comments made by other interviewees, both Catholic and Evangelical.

[26] As against possible romantic interpretations of this term, I would highlight that reciprocity, 'can be positive, as when brothers-in-law labour in each other's fields; or it can be negative, as when the two men quarrel and exchange insults' (Allen, 1997, pp. 76; see also Mannheim, 1991, pp. 89–90). For example, in the ritual battle of *Chiraje* (or *Tocto*) participants engage in reciprocal insulting, reciprocal beating, and reciprocal whipping (Dumézil and Alencastre, 1953, pp. 13, 14, 17), battle itself being an act of reciprocity. As Mayer (2002, pp. 110) put it, the Quechua word for reciprocity, *ayni*, can also be interpreted as 'revenge.'

human being. However, in animist worldviews a concept of 'person' can be understood as the broader category in which 'human' but also other-than-human persons are included. Put simply, within animist ontologies, 'persons', be they human beings or non-human elements such as animals, trees, or the earth itself, can be understood as, 'volitional, relational, cultural and social beings. They demonstrate intentionality and agency with varying degrees of autonomy and freedom' (Harvey, 2005, pp. xvii).

A number of insights into non-human personhood have originated from ethnographic work in the Amazon (e.g. Descola, 1993, Viveiros de Castro, 1998). The cosmologies of Andean people are perhaps related, but distinct, and the differences are instructive. In particular, Viveiros de Castro (1998) highlights the way diverse Amazonian peoples attribute subjectivity to non-humans, pointing out an 'essential relation' between what he titles Amerindian perspectivism and the symbolic importance of the hunt. Such societies with a 'hunting ideology' put particular emphasis on the personhood or subjectivity of animals (and, especially, prey and predators), whereas 'the spiritualization of plants, meteorological phenomena or artifacts seems [...] secondary or derivative in comparison' (pp. 472).

The people of the high Andean plateau in this study, in contrast, employ nothing like a hunting ideology – their livelihoods depend on (and their rituals reflect the importance of) basic subsistence agriculture (primarily potatoes) and the herding of livestock.[27] These activities require and reflect co-nurturing, rather than predator-prey relations. Maintaining good growing conditions for potatoes and pastures are therefore of the utmost importance, which in turn depend on the fertility of the soil and on climatic variability. I would therefore suggest that the earth (understood, as the planet as a whole, but also specific local environments) occupies a central symbolic and material role in the practices and beliefs of self-identified Catholics in this study. As such, the earth is not merely 'subjectivized' as may be the case with specific 'things' that take on partial subjectivity or personhood through their relationships with their human owners or creators, but rather, the earth is fully 'subjective' (see distinctions made in Santos-Granero, 2009; also Allen, 2002, pp. 126). In the Andean Catholic view, the earth is attributed a full sense of personhood and agency. The earth is thus not an 'it', but a 'she.'

Treating the earth as a person has implications that are not only ontological, i.e. what categories of things are thought to exist and what their statuses are, but also epistemological, that is, related to how people learn about and interact in the world. From this perspective, a non-human person (in this case, the earth) is framed, instead of 'as a separate object [...] as a subject co-living with the learner. [...] This epistemology generates knowledge which inheres in, grows from and supports social engagement, and it authorizes viewing "what" as a social "who"' (Naveh and Bird-David, 2013). In fact, in a similar way as the Nayaka people Bird-David studies, it seems to me that Andeans likewise, 'maintain social relationships with other beings not because [...] they a priori consider them persons. *As and when* and *because* they engage in and maintain relationships with other beings, they constitute them as kinds of person' (Bird-David, 1999, pp. 73, emphasis in original). Given that the norm of reciprocity regulates both human-human and human-non-human relationality in Andean worldviews, it is plausible to suggest that the relationship itself is of primary symbolic relevance, giving rise to an acutely relationally-aware epistemology that then places key non-human beings in subjective person positions.

Similarly, but closer to the current study site, De la Cadena (2015), whose ethnographic field is also in the Cusco region, builds on Barad's concept of intra-action and on Strathern's conception of relations not as something established between 'pre-existing' entities but as relations that constitute and bring into being the entities they relate. In this view, 'as intra-action, reciprocity is not a relationship *between* entities as usually understood in the Andean ethnographic record; it is a relationship from where entities emerge' (De la Cadena, 2015, pp. 103). Here, the social (subject-subject) relationality of Andean reciprocity makes possible the existence and subjectivity both of Andean people and of the earth with which (whom) they intra-act. That is, it is a process of co-constitution. As the practices that enact this relationship shift, so too do the identities of the co-related subjects (see below).

How, then specifically is the subjectivity of the earth (re)produced through the practice of *pago a la tierra?* Typically, *pago* is understood as a practice intended to maintain a positive (social) reciprocity relationship with the traditional (pre-Columbian) Andean earth deity *pachamama* (e.g. Bolin, 1998). Yet in this context, the precise nature of the being to which the *pagos* are destined must be nuanced. While most interviewees referred to the practice as *pago a la tierra* or simply *pago*, one Catholic interviewee in particular attempted to describe the role of *pagos* in the relationship with the earth and with God:

> I always walk with the earth, *pagando a la tierra* [paying the earth]. Some people don't pay anymore, but I do. You think I am going to gain something by paying? No. But, by paying the earth, we are giving to *el Señor* [the Lord] with... what's it called... like a letter... like what you give to a lawyer... a letter. (Interview #33)

The interviewee appears to be referring to a letter of attorney, whereby one grants another the power to act on their behalf as an intermediary.[28] The interpretation of the role of the earth as a lawyer interceding with God on the petitioner's behalf is almost certainly of Spanish colonial origin, as a similar metaphor existed regarding the role of Christian Saints as lawyers with respect to God as judge (see Yetter, 2017)[29].

This suggests that the earth fulfills an essentially similar function as a Catholic saint as an intermediary to God. In fact, another interviewee already cited above referred to the practice as *'pago a la Santa Tierra'* (Interview #38). Frequently in the literature related to current Andean Catholic conceptions of the earth, the name *pachamama* is accompanied by the Christianized epithet, *Santa Tierra*[30] (e.g. Flores Ochoa, 1974, pp. 247). Urton (1981, pp. 114) likewise mentions *Santa Tierra* as well as other names or aspects of p*achamama*, but only discusses the relationship between the terms *pachamama* and *pachatira* (*pachatierra*). In fact, for all that has been written on the Andean relationships with the earth and on

[27] Certainly (especially domesticated) animals have an important place in these herders' lives. They nurture and depend upon each other, and this relationship is enacted through livestock-oriented practices and rituals from the everyday to the more elaborate. They may indeed attribute personhood to livestock as well. Nevertheless, conversations with respondents in this study led to discussions of climate-related problems, and these were attributed to relationships with the earth. Even, for example, when they talked about their cows getting sick, they did not attribute this to the agency of the cow, or even anything to do with the cow in particular, but rather to the agency of 'environmental' phenomena – the earth was angry with us and sent hail that made the cow sick.

[28] Legal analogies for this relationship are perhaps not uncommon. De la Cadena (2015) describes how *pagos* at times 'echoed the practice of bribing judges' to influence the outcome of a court case (pp. 95), and how local people perceived *apu* Ausangate as acting 'like a lawyer', weighing *pagos* received from both sides of a conflict (pp. 96).

[29] Yetter, in her historical case in Bolivia, however concludes that the association of *pachamama* as an intermediary to God was an interpretation made by the colonizers only and was not accepted in the local belief system. Nevertheless, in the present study zone, this interpretation seems to have been incorporated into local Andean Catholicism, although variations likely persist.

[30] Also written '*santa tira*' (e.g. De la Cadena, 2015, pp. 107–108), reflecting Quechua pronunciation.

'*pachamama*', surprisingly little has been said about '*Santa Tierra*,' in those words, as employed here.

The term '*Santa Tierra*' has perhaps been assumed to be a mere Christianized translation of an (unchanged) underlying Andean concept, and thus not investigated in depth. Marzal (1994, pp. 146–147), (who incidentally cites ethnographic material using both the names *pachamama* and *Santa Tierra* but does not examine the latter term) proposes a variety of possible re-interpretations of *pachamama* in diverse Christianized Andean contexts: as an autonomous Andean divinity, as an intermediary to God, or merely as a symbol of God's providence. The 'middle' case, where *pachamama* is reinterpreted as an intermediary to God in a similar role as Catholic saints, appears to be the most relevant interpretation for self-identified Catholics in this study, and corresponds well to the epithet '*Santa Tierra*' as this informant employed.[31]

In the study area, self-identified Catholics, while emphasizing the importance of the practice of *pago* in maintaining a fruitful relationship with the earth, also recognized the role of God (referred to as *el Alto*, *el Senor*) in producing weather phenomena, particularly rainfall patterns, and other specific climate-related issues such as hail and frost. Local informants rarely referred to any concept of an abstract 'climate', rather, they either spoke generally of the importance of maintaining a relationship with the earth through *pagos* to ensure good harvests and avoid problems, or spoke of these specific problems themselves (hail, frost, cattle and plant disease) [32]as punishment from God for failed reciprocity with the earth.

Allen's (2002, pp. 34–36) fieldwork also in the Cusco region suggests God is perceived as the ultimate source of water and rain, but that local weather phenomena are influenced by *tirakuna* (earth beings, particular manifestations of *pachamama*). She further suggests that although, 'he sustains the world, God is a distant being whose lack of direct involvement in human affairs contrasts strikingly with *Pacha Mama*'s immediacy, vigilance, and sensitivity' (Allen, 2002, pp. 35). As an indication of this distance from everyday life, in the communities Allen studied just as in the case of Catholics in this study, ritual offerings were never made to God directly, only to the earth, perhaps as an intermediary to God as the previous quotes suggested.

On this basis, an attempt can be made to illustrate these relationships (Fig. 1, left side). The overall schema resembles that used by Wachtel (1977, pp. 81) to represent two-level reciprocity relations within the Inca state.

To summarize, the responses by self-identified Catholics can be understood as fitting within a worldview in which elements of (what we would call) the natural environment and the supernatural are included within a unified social sphere (there being in fact no other spheres). Relationships between these beings are understood as relationships between (human and non-human) persons; that is, the relationships are, again, properly social, and are regulated by the fundamental meta-norm of reciprocity. At the center of human-environment relations is the earth, *Santa Tierra*, understood as a sacred/social person, in the sense that she is properly engaged in a social relationship of reciprocity with human beings and with God. The consequences for not maintaining reciprocity relationships with the sacred/social earth through *pagos* is described as a punishment sent by the will of God. Therefore, within this view, while the relationship is not directly causal (e.g. humans cannot cause hail), humans are nevertheless morally responsible for failing to maintain reciprocity with the earth and must accept the consequences, such as climate-related problems like hail and frost. How this perspective relates to the local Andean Evangelical view (the right side of Fig. 1) will be discussed in the following section.

5.2. 'Nature' and the environment as a creation of God

The local Evangelical explanation for climate-related problems and changes and responses to these are likewise based upon and reflect a particular understanding not only of the earth but of the role of God and the nature of relations between these and humans. As an illustration, as part of one interviewee's response regarding why he no longer performs *pago a la tierra,* he explained that he believes '*la naturaleza*' (nature) is a creation of God, and that it is therefore to God that we should pay respect, not to the earth (see full interview excerpt in Section 5.3). Another self-identified Evangelical explained that he no longer performs *pagos* because, 'certainly, in the Bible it says the earth exists, but no, God created the earth too, so you have to be faithful to God only, not to the earth. So I don't do those *pagos*' (Interview #2). Rather than simply stating, 'our religion forbids *pagos*,' Evangelicals explain their unwillingness to perform earth offerings by interrogating the very nature of the earth itself. It is remarkable that this interviewee, in emphasizing that the earth is a creation of God, finds it necessary to first concede that (according to the Bible) the earth even exists, further underlining the ontological questioning at stake.

Fig. 1 (right side) attempts to illustrate the particular perception of the human-environment relationship that underlies the Evangelical narrative. For local Evangelicals who no longer perform *pagos*, their relationship to the earth and to God is radically altered, and so too are the identities of the terms in the relationships. As compared to the Catholic view presented previously, of central importance in their narrative is that Evangelicals feel they can directly petition God through prayer and reading the Bible. They thus gain a more intimate and direct relationship with God, previously seen as distant and relatively insensitive to human affairs.

Yet, in this altered schema of relations, the earth is not a sacred/social person and important intermediary to God with whom a respectful relationship of reciprocity should be maintained, as according to the local Catholic perspective. Rather, it is simply another of God's creations, like humans. Through this shifting relationship, the ontological position of the earth is simultaneously depersonized and desacralized. This means, on one hand, that the environment is no longer recognized as a 'person' within the social sphere. No longer a subject, but an object. Not a 'she,' but an 'it.' At the same time, it is desacralized in the sense that it is no longer to be respected in the way God is (or *Santa Tierra* was) because it is merely another of God's creations. No longer sacral, but mundane.

Evangelical agro-pastoralists certainly continue to interact with the environment in their everyday lives, but this interaction is largely restricted to material concerns. That Evangelicals see increasingly problematic climatic conditions as signs foretelling the end of

[31] Similarly, in some Aymara contexts the earth is referred to as *Tía Wirjina* (e.g. Bastien, 1992, pp. 155), indicating an association of the (sacred, productive) earth with the Virgin Mary, the holiest of saints. See also Yetter (2017).

[32] Whereas the discussion has focused on the practice of *pagos*, and the relationships between humans, God, and the earth, a fuller discussion would include an examination of the ontological nature of things like hail and frost themselves. This issue was not specifically investigated. However, the specific techniques used are perhaps indicative of the nature of hail as an example. Combatting imminent hailstorms specifically (apart from through maintaining *pagos* to avoid such problems in the first place) involves the burning of specific substances. One informant explained that burning things like old rubber sandals, cheese, kerosene or plastic produces foul-smelling smoke that acts like a 'poison' and 'scares' the hail away (Interview #48). The particular material seems to be important – these 'oily' materials may be perceived as related to the ritually-significant symbolic category of 'fat,' which is considered a basic substance of life and has an important role in Andean practices (See especially Canessa (2000), who interrogates the spiritual significance of fat, and its links with water and alcohol; also mentioned in e.g. Bolin (1998, pp. 41) and Gade (1983, pp. 782)). Although based on just a few interviews, it can be speculated that hail itself (although sent by the will of God) is likewise perceived to be alive and have at least a certain measure of agency, at least to the degree that it can be poisoned and scared off.

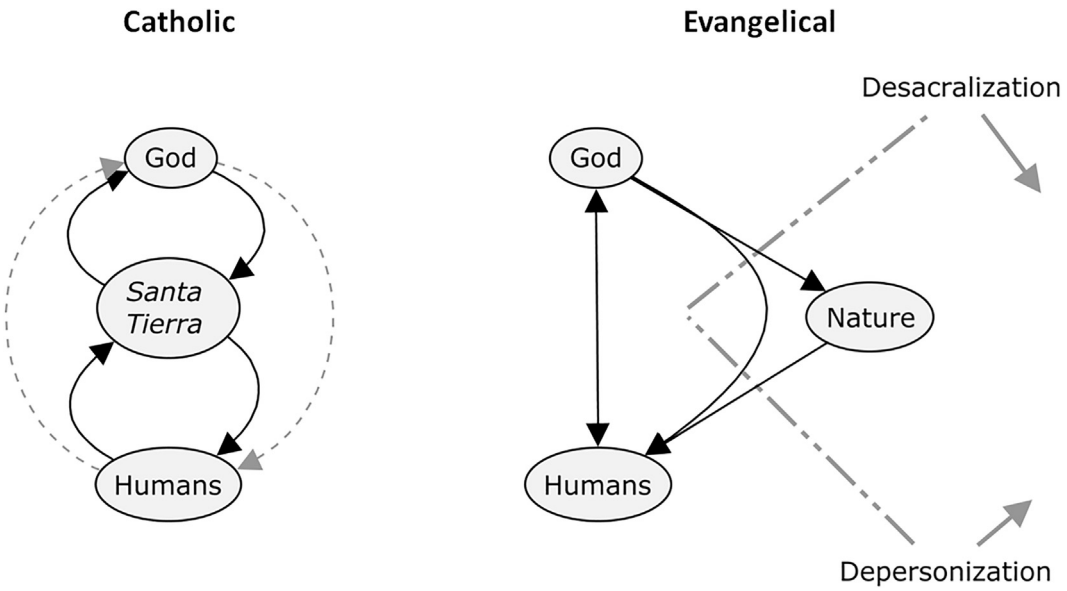

Fig. 1. Simplified illustration of human-environment relationships underlying two local narratives. Human-environment relationships underlying local Andean-Catholic (left) and Andean-Evangelical (right) narratives on climate-related problems and changes. In moving from Catholic to Evangelical schemas, *Santa Tierra* is displaced from its (her) central role as intermediary in a relationship of reciprocity with God and with humans, this displacement implying simultaneous processes of desacralization and depersonization. A more complete picture would include the roles of other sacred/social beings such as the Catholic saints, ancestors, and other earth beings such as *apus*.

the world suggests that the environment nevertheless remains a site of communication *from* God to humans. That is, God intervenes in the world, but nature is not itself an intermediary. Nature is like a book within which to read these signs, but not an interlocutor with whom one communicates.

This belief in the earth as 'nature', as a mere creation of God, rather than as a sacred/ social person helps explain why *pago a la tierra* would be seen as irrelevant or even idolatrous. It also explains why new techniques are used to deal with environmental problems. The combined (or rather, undistinguished) practical and ritual functions of the Catholic *pagos*, which correspond to an understanding of the environment as being as much social and sacred as material, are replaced, on one hand, with purely ritual activities such as reading Bibles intended to petition God directly to *intervene in* the material world, and on the other, purely practical techniques such as hail rockets, designed to directly address a practical problem in 'the environment'. That is, on one hand, there is a spiritual relationship with God, on the other, a practical relationship with the environment, and there is little overlap between the two.

The splitting of practical/rituals of the Catholics with their sacred/social earth, into distinct ritual (now, with God) and practical (now, with 'the environment') relationships may mirror what Catherine Allen refers to as a 'reorientation, away from the profound concreteness of native Andean religion, in which matter and spirit are never completely separable' (Allen, 2009, pp. 44). She suggests that the functional role of the group intoxication that accompanies Andean Catholic earth offering ceremonies, in which every drink of alcohol is shared with humans and non-humans alike, is, for Evangelical converts, replaced on one hand by communal binge drinking of soda pop, which follows all of the etiquette of alcohol drinking *except* libations to the earth beings, and on the other, ecstatic, intense group prayer. Evangelicals, 'no longer share their drinks with Mother Earth and Sacred Places. Rather, they pour forth their prayers to God the Father and find a kind of inebriation in prayer rather than in alcohol' (Allen, 2009, pp. 46). That is, the social and ritual functions of *pagos*, and the associated ceremonial function of alcohol, are divided – the communion of humans on one hand, and the communion between humans and God on the other. The only sacred/social role that the earth continues to play is as a symbol of divine providence (Marzal, 1994, pp. 146–147). The earth is no longer a person with whom to maintain reciprocity through the exchange of gifts, it is itself the gift.

This displacement of the earth from its traditional central position in a sacred/social cosmos of reciprocity relationships is linked to a broader and long-term trend that has previously been described as '*despachamamización*' (Caballero, 1981, pp. 84–85), which seems to be supported by, but is certainly not only attributable to, Evangelical conversion. It suggests a movement from a schema of relations with still clearly recognizable pre-Columbian traits (*pago a la tierra* as a recognition of reciprocity with a sacred/ social earth being), to what begins to resemble a modernist Nature/ Culture dualistic relationship (Descola, 2015; see also Rosengren, 2016). It remains for future research whether this shift towards a modernist model in Andean human-environment conceptions is accompanied by a corresponding willingness to objectify and commodify the earth (e.g. as epitomized by the term 'natural resources'). If so, the ongoing religious conversion of significant portions of Andean populations may (unintentionally) contribute to shifting toward beliefs and practices with significant consequences for environmental sustainability (cf. White, 1967).

5.3. Climate perception in entangled narratives of cultural and climatic change

The discussion thus far has attempted to trace out how local climate narratives reveal contrasting understandings of human-environment relationships. The essence of the argument is captured in Fig. 1. Yet, in this last part of the discussion I would like to shift to another level of analysis beyond pointing out that 'Andean Catholics' see things this way, and 'Andean Evangelicals' see it that way. Such a tidy portrayal of local perceptions does not capture the way these perceptions are deeply related to other aspects of everyday life. How people perceive climate-related problems is not only related to, but also in many ways superseded by, other everyday concerns in a particular socio-environmental context. Climate perceptions are embedded socio-culturally, in that relate to processes of identification and affiliation and rely

on cultural notions, values, and beliefs. Taking account of this embeddedness, 'illuminates the difficulty of unravelling climate change from the complex web of social and material relations that mediate people's interactions with their environments' (Barnes et al., 2013, pp. 543). I suggest that in seeking to explore not only what climatic changes are perceived but how they are understood and explained, one is compelled to examine not climate narratives per se but entangled narratives of cultural and climatic change.

The concept of entangled narrative refers to the tightly knit relationship that is expressed between what at first may appear to be unrelated themes. Narrative entanglement has been specifically explored in the context of self-narratives, that is, the stories that people construct in identification processes (see e.g. Frøystad, 2010; Brandon, 2016). Here, I emphasize the way that individual and collective narratives interweave different dimensions of life in the communities studied.

From this entanglement, I have focused in this study on extracting the thread of a storyline about climatic concerns and presenting this against the broader canvas of shifting and competing religious beliefs and human-environment relationships. That is, in selecting the focus of the study (e.g. through the choice of research and interview questions), I have determined what counts as 'text' and what is 'context.' Section 3 presented the context of competing Catholic and Evangelical beliefs and self-identifications and the motivations for Evangelical conversion before identifying 'local climate narratives' in Section 4. This structure was necessary to introduce the necessary 'background' for the reader's comprehension of the foregrounded material.

Yet, for local respondents, competing religious affiliations and beliefs are key dimensions of a visceral and immediate foreground. In respect for this, here I would like to restore the extracted 'text' to its proper 'context,' at least in some small measure. To do this, I present a more extensive interview passage that demonstrates how appropriate relationships to the environment were always bound up with stories about personal, social, and cultural change, and exemplifies the concept of entangled narrative:

> In the past, the custom was that the *curaca* was responsible for caring for nature. They conducted a rite when the *curaca* was going to give the offering to the earth. But in itself, no, for me that's not it. Because the nurturing of the whole universe is created by God, God himself manages it, knows how. It's for us to admire the order in which he has put the planet. Everything is in order.
>
> For me, I have more respect for the Creator. That's why I don't really go for that, because definitely those who... Now they say, "why don't we keep it up, it should be kept the same", but I realized that they did these offering services – people drank, *curaca*, got drunk, kept drinking, did their *carnaval*, made their *kaspa* [corn beer], and kept getting drunk. They maintained this bad habit, and all this about "why don't you keep it up like before", is like saying, "why don't you keep living like before." I never said that, but it was apparent in my expression; I don't go for that. I believe God created man himself, nature itself. He is the one who should be respected.
>
> Yes, he used to do it, my father was a *curaca*, and what did he do? He had to get his people together, contract the *carnavaleros* – they came with their natural clothing[33] – and he had to get hold of his hill, and according to the number of people, he had to get enough lambs to kill there. He did his offering, his *pago a la tierra*, they drank, dancing.
>
> In drinking, what used to happen? There are things that happen when you are drunk that you don't realize; lots of things happened. I myself noticed as a boy – ufff – they drank to the extreme. I saw the things that happened and I didn't much cling to them because my father himself had done them. Sometimes life is like an animal, drinking and getting in bed... As a young child I noticed and I came to a conclusion: what kind of blessing could this be if these things are going on? I saw them drunk there – anything could happen.
>
> Now things have changed. Music has come, many things. This contaminates the youth. Many people... people kill each other, suicides. I don't like these things, seeing it up close, right here in my district. The population has organized itself into a big party and even professional people kill each other; things that shouldn't happen. This brings consequences. The Devil himself works through this, oh how it attracts him, all evil. (Interview #21)

The interviewee's conception of the environment as 'nature' and his rejection of traditional *pagos* are in fact very difficult to disentangle from a number of other themes – the personal stories of his childhood, his experience of and disdain for alcohol abuse, his concern for the negative social consequences of immoral social behavior in his community, and his Evangelical faith. It should be emphasized that many of the short excerpted passages cited in previous sections for the purposes of identifying local climate narratives demonstrated a similar challenge for disentanglement. What one hears at the local level are not ready-made 'climate narratives', but rather, entangled narratives of cultural and climatic change.

6. Conclusion

Based on fieldwork in agro-pastoral communities in the highlands of Cusco, Peru, the paper has sought to identify local understandings of changing climatic conditions. In Section 3 the key role of *pago a la tierra* in local religious affiliations and beliefs was emphasized. The subsequent section introduced two local narratives that provide contrasting explanations for the climate-related problems and changes they experience, both of which make direct reference to religious beliefs and the *pago* ritual in particular.

To summarize the two narratives and their relationship, self-identified Catholic informants attribute climate-related problems such as poor harvests, hail, frost, and sick cattle to the abandonment of *pago a la tierra*, particularly since the arrival of Evangelical Protestantism in the study zone, whose converts eschew the practice. The Catholic narrative is anchored within a conception of the earth as a sacred/social 'person' and intermediary to God with whom a relationship of reciprocity must be maintained. In contrast, for self-identified Evangelicals, the climate-related problems and changes they identify can be understood as specific and already-foretold signs of the end of the world 'as written in the Bible.' Climate-related problems and changes are not understood as the indirect result of human behavior (as for Catholics), but rather inevitable elements of God's plan. Focusing on a direct relationship between humans and God through the Bible, the environment is viewed and engaged with not as a sacred/social 'person' but as a creation of God, merely 'nature,' suggesting dual processes of desacralization and depersonization with respect to the Catholic schema.

In particular, the paper has highlighted how, even within the space of a small study area that may seem at first relatively homogenous in terms of livelihoods activities, cultural background, and historical trajectory, two opposing narratives on climate-related problems and changes circulate, each based on

[33] Presumably, this refers to clothing made of local, 'natural' materials such as sheep and alpaca wool, and as such, an indicator of tradition. See endnote 11 on *bayeta*.

fundamentally distinct understandings of human-environment relationships related to diverging religious beliefs. Yet, while this paper has focused on climate perceptions within competing narratives as 'texts' against a broader socio-cultural 'context', the concept of entangled narrative was introduced to illustrate that how one views the climate simply cannot be disentangled, extracted and surgically removed from the full socio-cultural nexus in which this view is embedded and produced.

Three specific implications of this study for adaptation research and practice can be highlighted. First, the 'local perceptions of climate change' literature would benefit from moving beyond a view of perception-as-detection to perception-as-understanding, from studying *what* specific climate-related changes are observed, to *how* those changes are understood within particular socio-cultural contexts and from different ontological and epistemological perspectives (see e.g. Paerregaard, 2013; Cometti, 2015; Allison, 2015; Rosengren, 2016). Such a movement would require deepening the 'human dimensions' of climate change literature to embrace specifically its 'interior dimensions,' including attention to worldviews, values, and beliefs. As a starting point, a large body of existing research, particularly in environmental anthropology, human geography and cross-disciplinary fields such as political ecology on human-environment relations generally could fruitfully be incorporated into developing a more robust climate perceptions literature.

Second, the adaptation literature's focus on the 'tangible', material aspects of vulnerability, resilience, or adaptive capacity (see Shah, Angeles, and Harris, 2017) must be complemented by a nuanced understanding of the subjective experience of diverse groups faced with climate change (e.g. O'Brien, 2009; Scoville-Simonds and O'Brien, 2018; Shah et al., 2017). Much of the adaptation literature seems to assume that to comprehend the range of current and future adaptive responses across the globe, it is sufficient to assess the geographical distribution of vulnerability, itself assumed to be a function of exposure, sensitivity, and adaptive capacity. Yet, where in such formulations is there any space for the actual lived (which is to say, subjective) experience of diverse individuals and groups, their diverging and shifting interpretative frameworks, their values, worldviews, and beliefs, and their emotions and affective relations, that, social sciences have long told us, guide what people actually do? These aspects of life fit uneasily into categories like exposure, sensitivity, or adaptive capacity. It is clear that experiences of and responses to changing climatic conditions in diverse contexts will depend on much more than what can be credibly attributed to any of these three terms.

Finally, the existence of a diversity of local perspectives distinct to the scientific worldview that dominates climate debates suggests that serious ethnographic research and cross-cultural mediation efforts will be needed, not only if adaptation is to be successfully supported, but if climate justice is to include epistemic justice (e.g. Allison, 2015, pp. 501–512). As complicit parties in the production of climate change, I would further suggest that in addition to serious measures to address climate change and its impacts, it is our moral obligation to attempt to apprehend what such changes may *mean* to the impacted groups.

7. Declaration of interest statement

Conflicts of interest: none.

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